

A KNOWLEDGE-BASED VIEW ON KNOWLEDGE MANAGEMENT CAPABILITY AND PERFORMANCE: AN EMPIRICAL INVESTIGATION FOR PROJECT TEAM

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ABSTRACT

The repository and sharing of knowledge from existing human resources to their successors must be managed effectively to ensure business continuity and successful project execution. This article explains the knowledge repository and sharing capability with knowledge based view to project teams and highlights best practices that enable efficient project management. The purpose of this paper is to present that capabilities of knowledge management (KM) are identified and classified for project management team. The importance of knowledge sharing and repository has been emphasized in the knowledge body of project management, with the recognition that knowledge is often tacit and embedded within project teams. These enablers are utilized to affect knowledge management capabilities and to affect team work performance with a knowledge-based view. An empirical survey was conducted for project team members who use knowledge management system as knowledge management tool. The knowledge-based view is a research framework with which to interpret research findings. The results of the research suggest two main aspects: (1) The knowledge-based enablers (i.e., information technology, support, culture, and reward) have positive effect on knowledge sharing and repository. (2) The knowledge management capabilities (i.e., sharing and repository) have positive effect on project work performance. The results provide future researchers with useful means to assess the project performance in knowledge sharing and repository capability and to realize the benefits of a knowledge-based economy in project team.

KEYWORDS: Knowledge Base View, Knowledge Repository & Sharing, Project Management

INTRODUCTION

The growing importance of knowledge has motivated executives to focus on better managing their knowledge assets. With the emergence of the knowledge based view (KBV) (Nonaka 1991) that extrapolated the insights provided by the resource based view of the firm (Barney 1991).

Knowledge sharing and repository face many challenges in a project-based environment. Early debates on knowledge management (KM) tended to revolve around the use of information. Actually, each discipline has its own knowledge base and language, which can make the effective repository and sharing of knowledge even more problematic (Bresnen et al. 2003). Many studies have allocated knowledge resources to create advantage. Instead attention has increasingly shifted towards examining the role of the community or group in promoting or inhibiting knowledge sharing and repository (Brown and Duguid 2001).

KM practices with the expectation that KM capability should improve work performance. Much more emphasis is placed upon exploring the tacit and situated nature of knowledge and how it is embedded within particular social groups

and situations (Blackler 1995). This has exacerbated the poor understanding of KM practices in the project community. With this end in view, in this study we carried out a review of extant previous studies on enablers, KM capability, and performance relationship published articles. The specific research questions that I sought to address are as follows:

- What knowledge-based source enablers were adopted to affect KM sharing and repository capabilities?
- What KM sharing and repository capabilities affect project team performance?

Therefore, the purpose of this research was to understand enablers, knowledge sharing and repository capability, and team performance, focusing in particular on the knowledge-based view in an attempt to help improve its application in a context of project team work. The remainder of the paper is organized as follows: literature review, methodology, research results and conclusions.

LITERATURE REVIEW

Knowledge Base View in Project Environments

Knowledge-Based View (KBV) was originally proposed by Bierly and Chakrabarti (1996). The KBV conceives of KM capability as a valuable enabler of the organization for enhancing its performance. From a KBV of organizations, the focus is on managing knowledge resources, and the associated aspects of human and material resources having capabilities for governing, operating on, and otherwise deploying knowledge (Paradice and Courtney 1989). To effective KM more generally reflect the various ways in which knowledge can be embedded embodied within the skill sets and competencies of individuals and groups (Blackler 1995).

Knowledge-Based Resource Enablers

Information Technology

Information technology can be viewed as both a key contributor and enabler to the field of KM (Davenport and Prusak 1998a). This perspective is related to technological ability in capturing data, information, and knowledge that surpasses human capacity in absorbing and analyzing these, in a focused manner (Shenk 1997). In addition to computer hardware, software and organizational process are also important. Herder et al. (2003) thought effective IT tool aimed at establishing knowledge relations.

Management Support

The importance of management support is a common cliché for all situations involving change and new technology adoption. The management support includes top management support, as well as organizational ability to conceive, develop, and exploit IT applications to support and enhance other business functions. Previous studies have observed that top management support can benefit individuals (Elbeltagi, McBride, and Hardaker 2005, Quaddusa and Xub 2005)

Culture

Organizational culture is believed to be the most significant input for effective KM and organizational learning, since it determines values, beliefs, and work systems that could encourage or impede learning as well as knowledge sharing (Alavi and Leidner 2001, Gold, Malhotra, and Segars 2001). Therefore, organization culture should provide support and incentives and encourage knowledge-related activities by creating environments for knowledge exchange and accessibility. Learning culture and learning climate are closely related and are generally assumed to significantly impact

individual, team, and organizational learning (Gold, Malhotra, and Segars 2001).

Reward

Because of the value of time, extrinsic rewards are important for knowledge sharing in organizations(Pan and Scarbrough 1999). Many practitioners and researchers have stated that “nontrivial” extrinsic rewards for knowledge sharing are important motivators (Gupta and Govindarajan 2000). Some organizations have also provided incentives or tie rewards (promotion and bonuses) to knowledge contributions and reuse(Davenport and Prusak 1998a).

Knowledge Management Capability

Knowledge Sharing Capability

Knowledge sharing can be either informal or formal, as well as either personal or impersonal (Holtham and Courtney 1998). Knowledge sharing occurs at various levels: sharing of knowledge between individuals, from individuals to explicit sources, from individuals to groups, between groups, across groups, and from groups to organizations (Alavi and Leidner 2001). Individuals connected through a network of practice may never know or meet each other face to face, they are capable of sharing a great deal of knowledge (Brown and Duguid 2001). Knowledge sharing affects the motivation to implement knowledge to be of value for the organizations (Gold, Malhotra, and Segars 2001, Freeze 2006). Knowledge sharing will strongly affect performance (O'Dell and Grayson 1998, Davenport and Prusak 1998a, Davenport and Prusak 1998b).

Knowledge Repository Capability

With the growing body codified knowledge in organizational memories, knowledge retrieval is a core component to access knowledge items in knowledge repository (Kwan and Balasubramanian 2003). The capability to store and retrieve text is an important aspect of a knowledge repository (O'Leary 1998). Knowledge retrieval is a core component to access knowledge items in knowledge repository (Kwan and Balasubramanian 2003). A knowledge repository is a collection of both internal and external knowledge.

The repository approach focuses on how structured knowledge can be converted, codified, and stored. Knowledge repository means converting tacit knowledge to explicit knowledge. Explicit knowledge can be expressed in words and numbers and shared in the form of data, scientific formula (Emin 2000). The repository strategy was presented by Hansen, Nohria, and Tierney (1999). Therefore, the repository strategy converses knowledge as it was created, and stores it either as is de-context so that it can be applied to more contexts.

Project Performance Measurements

Project performance measurements include accuracy, quality improvement, productivity, quality, reliability, effectiveness, efficiency, process performance, and customer satisfaction growth, Meanwhile, learning measures include items such as the hours of learning and the number of employees trained. Non-finance-based measurement is more suitable for evaluating intellectual capital(Johnson et al. 1999). Performance can be assessed by the employee themselves and the halo effect is relatively weak (Thornton 1980).

RESEARCH DESIGN AND METHODOLOGY

Research Framework and Hypotheses

Only three major constructs are included in the framework (see figure 1).

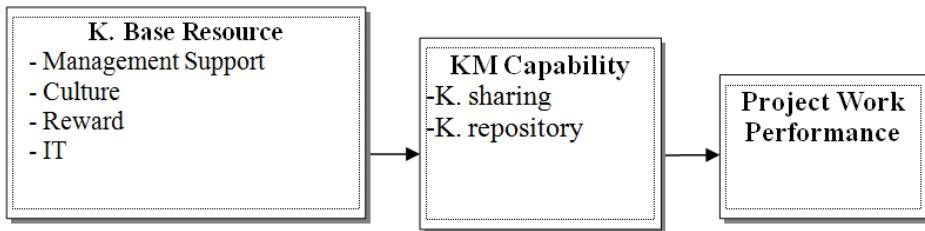


Figure 1: Research Model

Based upon the research questions and the above literature, the following hypotheses are posited:

H1: Knowledge-based resources have a positive effect on knowledge sharing and repository capability.

H2: Knowledge sharing and repository capability have a positive effect on project work performance.

Operational Definition and Measurement

Multiple items were used to measure the key constructs. Management support is a measure of the organization's interest in the welfare of the employee. Culture measures the atmosphere of organization. Reward is a measure of how well the organization recognizes employee performance with rewards. Support, culture, and reward measurement are adapted from research(Janz and Prasamphanich 2003).

Knowledge sharing capability is those processes oriented toward involving joint use of resources, transferring and distributing information, and exchanging knowledge by the KMS applications. Knowledge repository capability is those processes oriented toward making existing knowledge storage by the KMS applications. The measurements are reference from research(Sabherwal and Becerra-Fernandez 2003).

The measurement of project work performance is measure by efficiency and effectiveness of project work. Efficiency refers to the amount of work produced with a given amount of resource inputs. Effectiveness is the degree to which the work product meets users' requirements(Henderson and Lee 1992).

Subjects

The population under study in each of these companies was project team members of the organizations knowledge management systems. The 198 respondents to the survey represent all levels within the organization that are project team members. Over 80% of respondents are under 40 years old, more than 50% of respondents had five years of work experience, and over one year experience in their respective companies' KMS.

RESULTS OF RESEARCH

Reliability and Validity

The main effect was analyzed using AMOS, a software package based on structural equation modeling (SEM) techniques. This research conducted confirmatory factor analysis to assess the reliability and validity of the multi-item measures for the 3 constructs. The resulting scales are presented in Table 1 along with goodness-of-fit indices

Table 1: Reliability of the Indicators and Model Fit Measures

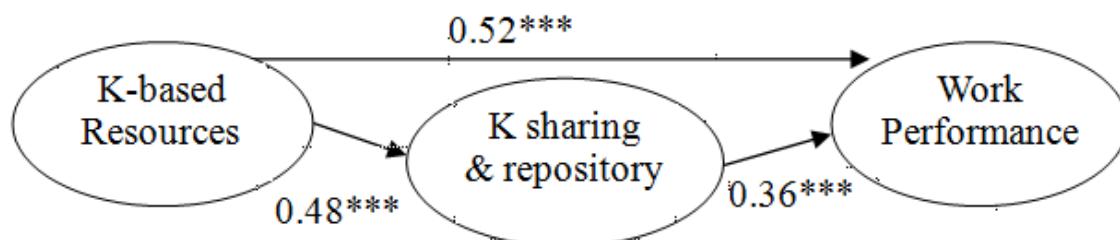
Construct / Indicator	No. of Items	Reliability, α	Model Fit Measures
K. capability			
K. Repository	4	0.87	$\chi^2=454.66$, df=6, $\chi^2/\text{df}=75.78$, GFI=0.99, AGFI=0.95, NFI=0.99, CFI=0.99, RMR=0.03
K. Sharing	5	0.86	
Work Performance			$\chi^2=247.88$, df=2, $\chi^2/\text{df}=123.9$, GFI=0.92, AGFI=0.92, NFI=0.9, CFI=0.97, RMR=0.01
K. Based Resource Enablers			$\chi^2=196.27$, df=10, $\chi^2/\text{df}=19.62$, GFI=0.98, AGFI=0.88, NFI=0.94, CFI=0.96, RMR=0.08
Support	5	0.74	
Culture	4	0.67	
Reward	4	0.80	
IT	7	0.92	

The Cronbach's alpha values for each indicator scale also are listed in Table 1. Reliabilities for all eleven constructs are above 0.6. Overall, scales for all constructs were deemed acceptable in quality(Nunnally 1978). The properties of the reliability of the constructs (composite reliability=0.77~0.96), and the average variance extracted (AVE) were used as the measures for convergent validity (AVE=0.71~0.84). The measurement model seems to possess adequate convergent validity(Bagozzi and Yi 1988). Discriminant validity was assessed when the squared correlation between two constructs is lower than the respective average variance extracted. Overall, all of the eleven constructs show evidence of discriminant validity.

Structural Model Analysis

The structural model analysis was conducted to examine the hypothesized relationships among constructs. The results from the structural model used to test the hypothesized research model are shown in Figure 2. Three of the path coefficients were statistically significant ($p \leq 0.05$), which is considered meaningful.

The relationship between knowledge-based resources (i.e., support, culture, reward, and IT) and knowledge sharing & repository capability is statistically significant (H1 supported). The relationship between knowledge sharing & repository capability and work performance was statistically significant (H2 supported).



Significance levels: * $p \leq 0.05$; ** $p \leq 0.01$; *** ≤ 0.001 .
 $\chi^2/\text{df}=0.882$; GFI=0.994; AGFI=0.967; NFI=0.993; CFI=0.92.

Figure 2: The Structure Model Result

CONCLUSIONS

Since KM sharing & repository capability is an important organizational variable for project management, researchers have further argued which KM capability in organization KM should become a focal point of inquiry(Alavi and

Leidner 2001). Due to the link between KM sharing & repository capability and the measures of project work performance is not well understood.

This new knowledge-based framework makes a number of key contributions. It integrates concepts from enablers, KM sharing & repository capabilities and work performance of project team. In doing so, it places knowledge strategy on a more theoretically sound basis.

Results indicate that sharing and repository capabilities have direct positive effects on work performance. Specifically, the assessment would highlight very useful information for evaluating and compensating knowledgeable team workers, and allocating and developing human capital depending on the business needs. This framework is just a beginning, but highlights a number of areas for further research.

The implications of this study are summarized below. In today's highly competitive modern business environment, organizations face difficult decisions regarding whether to adopt new and innovative KM systems for project management. Most research on user performance and technology use has examined the impact influence of technology functions and task characteristics.

Accordingly, the results of this study may provide a basis for a practical implication. In practice, support, culture, reward, and IT must be considered as the important enablers for doing knowledge management under project management context. The results provide some potential valuable insights for practical applications.

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